

AMENDMENTS TO THE CLAIMS

The following is a complete listing of revised claims with a status identifier in parenthesis.

LISTING OF CLAIMS

1. (Previously Presented) A device for placing flip chips on a substrate in the form of a leadframe, the device comprising a movable placement head, which picks up the flip chips from a stock of components and places them on the substrate, the placement head being provided with a turning device for the flip chips, the placement head being provided with a multiplicity of grippers circulating in a turret-like indexed manner, the turning device being assigned to a stationary part of the placement head, the turning device taking one of the flip chips in a first holding station of the grippers and after turning the chip, returning the turned chip to one of the grippers in one of the downstream holding stations.

2. (Previously Presented) The device as claimed in claim 1, wherein the turning device has two pivotable holders, one of the two holders can be aligned with the first of the holding stations, and a second holder of the two holders can be aligned with a downstream one of the holding stations and wherein the two holders can be pivoted into a mutual transfer position, in which their ends, carrying the flip chip and projecting toward each other, are aligned with each other.

3. (Previously Presented) The device as claimed in claim 2, wherein the holders are designed as pivotably mounted suction pipettes, wherein the grippers are designed as suction grippers protruding radially from the placement head, wherein the holders have pivoting axes extending perpendicular to a turning plane of the grippers and being arranged on axial extensions of the grippers and wherein longitudinal axes of the holders and of the grippers are in line with one another during the transfer of the flip chips therebetween.

4. (Previously Presented) The device as claimed in claim 3, wherein a clearance between the holders directed oppositely facing each other and in line with each other in the transfer position is somewhat larger than the thickness of the flip chips.

5. (Previously Presented) The device as claimed in claim 4, wherein the first and downstream holding stations are arranged immediately following each other.

6. (Previously Presented) A device according to claim 3, wherein the first and downstream holding stations are arranged immediately following one another.

7. (Previously Presented) A device according to claim 2, wherein a clearance between the holders while facing each other in the transfer position is larger than the thickness of the flip chips.

8. (Previously Presented) A device according to claim 7, wherein the first and downstream holding stations are arranged immediately following each other.

9. (Previously Presented) A device according to claim 2, wherein the downstream holding station is arranged to immediately follow the first holding station.

10. (Previously Presented) A device according to claim 1, wherein the downstream holding station immediately follows the first holding station.

11. (Previously Presented) A device for changing the orientation of a chip, comprising:

first means for picking up at least one chip; and
second means for receiving the at least one chip, for changing the orientation of the chip, and for returning the chip.

12. (Previously Presented) The device of claim 11, further comprising:

a stationary part, wherein the first and second means are each connected to the stationary part.

13. (Previously Presented) The device of claim 11, wherein the first means includes a plurality of holding stations.

14. (Previously Presented) The device of claim 13, wherein the second means is for receiving the at least one chip from one of the plurality of holding stations and for returning the at least one chip to another one of the plurality of holding stations.

15. (Previously Presented) The device of claim 14, wherein the second means is for returning the at least one chip to a holding station immediately downstream from the holding station from which the at least one chip was received.

16. (Previously Presented) The device of claim 13, wherein: the plurality of holding stations include grippers, circulating in a turret-like manner.

17. (Previously Presented) The device of claim 16, wherein the grippers protrude radially from the first means, and

wherein the second means includes at least two pivotable holders having pivoting axes extending perpendicular to a turning plane of the grippers and are arranged such that the holders and the grippers are in line with one another during the receiving or returning of the chip.

18. (Previously Presented) The device of claim 16, wherein:
the grippers are suction grippers.

19. (Previously Presented) The device of claim 14, wherein
the second means includes two pivotable holders; wherein
a first pivotable holder is alignable with a first holding station, and a
second pivotable holder is alignable with another of the holding stations, and
wherein the two holders are pivotable into a mutual transfer position, in which
their ends, carrying the chip, are alignable with each other.

20. (Previously Presented) The device of claim 19, wherein
the pivotable holders are designed as pivotably mounted suction pipettes.

21. (Previously Presented) The device of claim 19, wherein
a clearance between the holders directed oppositely facing and in line
with each other in the mutual transfer position is larger than the thickness of
the chip.

22. (Previously Presented) A device for reorienting a chip comprising:
at least two pivotable holders, wherein
a first of said at least two pivotable holders and a second of said at least two pivotable holders are adapted to be pivoted into a mutual transfer position, wherein ends of the first and second pivotable holders, adapted to hold the chip, are adapted to be aligned with each other.

23. (Previously Presented) The device of claim 22, further comprising:
a stationary part and a movable part, wherein the at least two pivotable holders and the moveable part are connected to the stationary part; and
the moveable part is adapted to pick up at least one chip.

24. (Previously Presented) The device of claim 22, wherein
the movable part includes a plurality of holding stations.

25. (Previously Presented) The device of claim 24 , wherein
the first of said at least two pivotable holders is adapted to receive a chip from one of the plurality of holding stations and is further adapted to return the chip to another one of the plurality of holding stations.

26. (Previously Presented) The device of claim 25, wherein

the second of the at least two pivotable holders is adapted to return the chip to a holding station immediately downstream from the holding station from which the chip was received.

27. (Previously Presented) The device of claim 24, wherein:
the plurality of holding stations include grippers, adapted to circulate in a turret like manner.

28. (Previously Presented) The device of claim 27, wherein
the grippers protrude radially from the movable part; and
the at least two pivotable holders include pivoting axes extending perpendicular to a turning plane of the grippers and are arranged such that the holders and the grippers are in line with one another during the receiving or returning of the chip.

29. (Previously Presented) The device of claim 28, wherein:
the grippers are suction grippers.

30. (Previously Presented) The device of claim 22, wherein
the pivotable holders are pivotably mounted suction pipettes.

31. (Previously Presented) The device of claim 22, wherein
a clearance between the holders directed oppositely facing and in line

with each other in the mutual transfer position is larger than the thickness of the chip.

32. (New) A device for placing flip chips on a substrate in the form of a leadframe including the device of claim 11.

33. (New) A device for placing flip chips on a substrate in the form of a leadframe including the device of claim 22.